REMARKS/ARGUMENTS

These remarks are made in response to the Office Action of June 28, 2004 (Office Action). A one-month extension of time is respectfully requested for the filing of this response.

Prior to addressing the Examiner's rejections, it may be useful to summarize aspects of Applicants' invention. The invention is directed to improving speech recognition accuracy, especially with regard to expressions, characters, or words that can correspond to a plurality of alternative readings. A system according to the invention utilizes correspondence information for storing correspondences between recognized words and speech element arrays for expressing pronunciations of recognized words. The correspondence can be used for recognizing words from entered speech input based upon a comparison of a speech element array generated from a user-spoken utterance with speech element arrays in the correspondence information.

Applicant's invention reflects the Applicant's recognition that the same person can be apt to maintain the same reading in the same conversation. For example, a person who, in one reading, pronounced "00" as "double zero" is more likely to pronounce "double zero" consistently in subsequent readings during a conversation or other speech recognition event. By utilizing this tendency, subsequent recognitions can be improved since the fact that a recognized word will be repeated allows for reduced comparisons of speech element arrays. Thus, for the speaker who already has pronounced "00" as "double zero", the system recognizes subsequent reading of "double zero" at the time each is rendered. Accordingly, it further follows that a pronunciation prediction probability corresponding to one of a plurality of speech element arrays is lowered with Applicant's invention.

The Examiner has rejected claims 1, 3-4, 15, 17-18, 29-30, 32 and 33 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,182,039 to Rigazio, *et al.* (Rigazio), in view of U.S. Patent No. 5,133,012 to Nitta (Nitta). Claims 2, 16, and 31 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rigazio in view

Nitta and further in view of U.S. Patent 6,208,966 to Bulfer (Bulfer). Claims 6 and 20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rigazio in view Nitta and Bulfer and further in view of U.S. Patent No. 5,829,000 to Huang, *et al.* (Huang).

Claims 10, 14, 24, and 28 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rigazio in view Nitta, Bulfer, and Huang, and further in view of U.S. Patent No. 4,696,042 to Goudie (Goudie). Claims 8, 12, 22, and 26 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rigazio in view of Nitta, Bulfer and Goudie. Claims 5, 19, and 34 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rigazio in view of Nitta and further in view of Huang. Claims 9, 13, 23, and 27 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rigazio in view of Nitta and Huang and further in view of Goudie. Finally, Claims 7, 11, 21, 25, 35, and 36 have been rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Rigazio in view of Nitta and further in view of Goudie.

Applicant respectfully submits that with regard to Rigazio, the reference fails to disclose or suggest those features of Applicant's invention for which the reference is cited. Moreover, the prior art provides no teaching, suggestion, or motivation for modifying Rigazio to achieve Applicant's invention. More fundamentally, as explained in detail in the ensuing discussion, the nature of Rigazio precludes its modification to encompass each of the features of Applicant's invention.

Firstly, Rigazio does not disclose or suggest a speech recognition system that includes correspondence information as in Applicant's invention. With regard to Applicant's invention, correspondence information as recited in independent Claim 1 stores a correspondence between recognized words and a plurality of speech element arrays, the latter expressing pronunciation of recognized words. As described above, a correspondence stored by the correspondence information serves as a basis for recognition of a recognizable word based on comparing a speech element array generated from a user-spoken utterance.

Rigazio, by contrast, describes no such stored correspondence regarding recognized words. Rather, Rigazio is directed to an entirely different objective using a fundamentally different system and procedure. Rigazio describes a process of extraction of features from a user utterance followed by an alignment or matching of the features with a pre-defined set of parameters extracted from speech supplied during a training phase. (Col. 3, lines 39-56.) This, however, merely describes a standard process for learning acoustic characteristics based on training data supplied by a peculiar speaker. But as Applicant's specification expressly notes, Applicant's invention "is not intended for learning acoustic characteristics peculiar to a speaker." (Applicant's Specification, p. 16, lines 25-27.) The correspondence information in Applicant's invention provides correspondences between recognized words and a plurality of speech element arrays expressing their pronunciations. As stated in the specification, it is not directed to acoustic-based features that are the basis of the extractions and subsequent comparisons of Rigazio.

The distinction is particularly acute given that, as further stated in Applicant's specification, the recognition obtained by Applicant's invention can be based, for example, on introduced base grammar data. (See, e.g., Applicant's Specification, p. 15, lines 1-22.) With Applicant's invention, recognition probability can be improved when speech elements with relatively small pronunciation probabilities are deleted to thereby improve recognition using reduced grammar data. That Rigazio is directed to an entirely different procedure is forcefully brought home by the fact that none of the advantages obtained using reducible grammar data as in Applicant's invention can be achieved with Rigazio. Nothing in the prior art even hints at how one could extend Rigazio's acoustic-based features comparison to encompass the features of Applicant's invention.

It follows, also, that the lack of teaching or suggestion in Rigazio regarding correspondence information as taught by Applicants invention likewise precludes any suggestion that Rigazio even hints at another feature of Applicant's invention, namely correspondence information-based recognition of recognizable words. Specifically,

Rigazio fails to teach or suggest recognizing a recognizable word from a received user spoken utterance by comparing a speech element array generated from a user utterance with the plurality of speech element arrays in the correspondence information as recited in independent Claim 1. Similarly, Rigazio fails to teach or suggest a method or computer-based instructions using either correspondence information or recognition of recognizable words based thereon, as recited, respectively, in independent Claims 15 and 30.

The Examiner correctly acknowledges at pages 2 and 4-5, that Rigazio similarly fails to disclose lowering of a prediction probability corresponding to a plurality of speech element arrays as recited in each of independent Claim 1, 15, and 30. Thus the rejections of each of independent Claims 1, 15, and 30 are based on a combination of Rigazio with Nitta. Nitta relates to a speech recognition system wherein a plurality of candidate phonetic segments extracted from the input speech signal are passed through pre-defined transition networks so as to obtain a score by weighting or averaging so-called long-term strategic scores taking consideration of both a statistical distribution of the similarities phonetic segments and the short-term strategic scores by taking consideration of the environment of the phonetic segments.

Nitta, however, merely represents the use of statistical decision making in the context of acoustic-based phonetic analyses. Like Rigazio, Nitta neither teaches nor suggests anything regarding correspondence information or its use for recognizing a recognizable word from a received user spoken utterance by comparing a speech element array generated from the user utterance with a plurality of speech element arrays in the correspondence information, as recited in each of independent Claims 1, 15, and 30. Regardless of Nitta's reliance on statistical measures for judging phonetic similarities, the reference, like Rigazio, neither teaches nor suggests correspondence information or comparisons utilizing correspondence information for recognizing recognizable words.

It follows, therefore, that Nitta provides no hint of affecting pronunciation prediction probabilities in the context of comparisons based upon correspondence information as taught by Applicant's invention. Accordingly, Nitta can not be read as supplying that which is lacking in Rigazio regarding the lowering of a prediction probability corresponding to a plurality of speech element arrays as recited in each of independent Claim 1, 15, and 30.

Even if one accepts for the sake of argument that Nitta is analogous art in relation to Rigazio, as the Examiner asserts at pages 3 and 5 of the Office Action, that is merely a necessary condition but it is not sufficient. It remains incumbent to provide an objective basis for the combination put forward. See, e.g., In re Mills, 916 F.2d 680 (Fed. Cir. 1990) (the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination.) The only logical basis could be that Rigazio is directed to accomplishing phonetic analysis and Nitta provides a statistical means for effecting such analyses. Yet it remains, that as already explained, neither reference teaches nor suggests correspondence information or recognition of recognizable words based upon comparisons using a correspondence as taught by Applicant's invention. The prior art accordingly fails to provide a basis for extending either reference to reach the elements and advantages of Applicant's invention.

It follows that Rigazio, either alone or in combination with Nitta, fails to teach or suggest each of the features recited in independent Claims 1, 15, and 30. Therefore, Applicant respectfully submits that neither reference, individually or in combination with the other, supports a finding of obviousness of the independent claims under 35 U.S.C. § 103(a). See, e.g., In re Fine, 873 F.2d 1071 (Fed. Cir. 1988). Applicant respectfully maintains further that in so far as independent Claims 1, 15, and 30 are patentable, so, too, are each of the remaining dependent claims which depend from the independent claims and recite additional features.

In light of the above remarks, Applicant respectfully requests that the 35 U.S.C. § 103(a) rejection to Claims 1-36 be withdrawn. Applicant believes that this application is now in full condition for allowance, which action is respectfully requested. Applicant requests that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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